

IN THE CLAIMS:

1. (Previously Presented) A system for controlling a hydraulic actuator in a subsea locale, said hydraulic actuator adapted to operate when provided with a sufficient pressure to open a downhole safety valve, said system comprising:

a first hydraulic cylinder;

an isolated supply of fluid provided to said first hydraulic cylinder, said isolated supply of fluid positioned in an environment that is at a pressure other than atmospheric pressure;

an actuator device coupled to said first hydraulic cylinder, said actuator device positioned in said environment, said actuator device adapted to drive said first hydraulic cylinder to create said sufficient pressure in said fluid; and

at least one hydraulic line operatively intermediate said first hydraulic cylinder and said hydraulic actuator, said at least one hydraulic line supplying said sufficient pressure in said fluid to said hydraulic actuator in said subsea locale to thereby open said downhole safety valve.

2. (Canceled)

3. (Original) The system of claim 1, wherein said actuator device is an electric motor and gear assembly.

4. (Original) The system of claim 1, further comprising:

a hydraulic fluid supply reservoir for storing a quantity of said supply of fluid, said fluid in said hydraulic fluid supply reservoir at a pressure that is less than said sufficient pressure; and
an operation control valve in said at least one hydraulic line selectively positionable to put said hydraulic actuator in fluid communication with either of said first hydraulic cylinder and said hydraulic fluid supply reservoir.

5. (Original) The system of claim 1, further comprising:

a bypass control valve operatively connected to said first hydraulic cylinder to permit said actuator device to drive said first hydraulic cylinder without substantially increasing a pressure of said fluid.

6. (Original) The system of claim 1:

wherein said first hydraulic cylinder comprises a movable pressure barrier, a first chamber and a second chamber, and wherein said first chamber is adapted to be in fluid communication with said supply of fluid, said second chamber is adapted to be selectably in fluid communication with said hydraulic actuator; and
a bypass control valve selectively providing fluid communication between said first chamber and said second chamber.

7. (Original) The system of claim 1, further comprising:
a resupply line and a resupply coupling, said resupply coupling adapted to interface with
an external source of fluid; and
said resupply line being positioned intermediate said resupply coupling and said
hydraulic supply reservoir.
8. (Canceled)
9. (Canceled)
10. (Canceled)
11. (Canceled)
12. (Canceled)
13. (Canceled)
14. (Original) The system of claim 1, wherein said hydraulic fluid is comprised of
seawater.

15. (Previously Presented) A system for controlling a hydraulic actuator in a subsea well, comprising:

a first hydraulic cylinder;

an isolated subsea source of hydraulic fluid provided to said first hydraulic cylinder;

an actuator device positioned subsea and coupled to said first hydraulic cylinder, said actuator device adapted to drive said first hydraulic cylinder to pressurize said fluid; and

at least one hydraulic line for supplying said pressurized fluid to said hydraulic actuator in said subsea well, wherein said hydraulic actuator is adapted to open a downhole safety valve when said pressurized fluid is supplied to said hydraulic actuator.

16. (Canceled)

17. (Previously Presented) The system of claim 15, wherein said hydraulic actuator in said subsea well comprises a single-acting hydraulic cylinder having an actuator piston and a return spring, said actuator piston being movable between a first position in which said downhole safety valve is open, and a second position in which said downhole safety valve is closed, said actuator piston being movable to said first position when said pressurized fluid is supplied to said single-acting hydraulic cylinder, and said actuator piston being movable to said second position by said return spring when said single-acting hydraulic cylinder is vented to thereby allow a pressure of said pressurized fluid to be reduced.

18. (Original) The system of claim 15, wherein said actuator device comprises an electric motor.

19. (Original) The system of claim 15, further comprising a first control valve disposed between said hydraulic cylinder and said hydraulic actuator in said subsea well, said first control valve having at least a first position which allows said pressurized fluid to be supplied to said hydraulic actuator in said subsea well and a second position which vents said pressurized fluid in said hydraulic actuator in said subsea well to thereby reduce a pressure of said pressurized fluid.

20. (Canceled)

21. (Canceled)

22. (Canceled)

23. (Canceled)

24. (Canceled)

25. (Canceled)

26. (Currently Amended) A method of controlling a subsea hydraulic actuator, said hydraulic actuator adapted to operate when provided with a sufficient pressure to open a subsea safety valve, said method comprising:

providing an isolated subsea supply of fluid;

providing fluid from said isolated subsea supply of fluid to a first hydraulic cylinder that is actuated to create said sufficient pressure in said fluid, said first hydraulic cylinder being positioned subsea and being operatively connected to said hydraulic actuator by at least one hydraulic line; and

communicating said sufficient pressure to said hydraulic actuator via said at least one hydraulic line to thereby open said subsea safety valve;

actuating an operation control valve positioned in said hydraulic line to place said hydraulic actuator in fluid communication with said first hydraulic cylinder or a hydraulic fluid supply reservoir, said reservoir adapted to store fluid at a pressure that is less than said sufficient pressure; and

resupplying fluid to said isolated supply of hydraulic fluid through a resupply line and a resupply coupling, said resupply coupling adapted to interface with an external source of hydraulic fluid, and said resupply line operatively intermediate said resupply coupling and said hydraulic supply reservoir.

27. (Canceled)

28. (Canceled)

29. (Currently Amended) The method of ~~claim 28~~ claim 26, further comprising:
filling said first hydraulic cylinder with a portion of said supply of hydraulic fluid by
opening a bypass control valve selectively providing fluid communication
between a first chamber and a second chamber of said first hydraulic cylinder,
said first chamber in fluid communication with said supply of hydraulic fluid, and
said second chamber in fluid communication with said hydraulic actuator.
30. (Canceled)
31. (Canceled)
32. (Previously Presented) A system for controlling a hydraulic actuator in a remote
locale, said hydraulic actuator adapted to operate when provided with a sufficient pressure, said
system comprising:
a first hydraulic cylinder;
an isolated supply of fluid provided to said first hydraulic cylinder, said isolated supply
of fluid positioned in an environment that is at a pressure other than atmospheric
pressure;
an actuator device coupled to said first hydraulic cylinder, said actuator device positioned
in said environment, said actuator device adapted to drive said first hydraulic
cylinder to create said sufficient pressure in said fluid, wherein said actuator
device is an electric motor and gear assembly; and

at least one hydraulic line operatively intermediate said first hydraulic cylinder and said hydraulic actuator, said at least one hydraulic line supplying said sufficient pressure in said fluid to said hydraulic actuator in said remote locale.

33. (Previously Presented) A system for controlling a hydraulic actuator in a remote locale, said hydraulic actuator adapted to operate when provided with a sufficient pressure, said system comprising:

a first hydraulic cylinder;

an isolated supply of fluid provided to said first hydraulic cylinder, said isolated supply of fluid positioned in an environment that is at a pressure other than atmospheric pressure;

an actuator device coupled to said first hydraulic cylinder, said actuator device positioned in said environment, said actuator device adapted to drive said first hydraulic cylinder to create said sufficient pressure in said fluid;

at least one hydraulic line operatively intermediate said first hydraulic cylinder and said hydraulic actuator, said at least one hydraulic line supplying said sufficient pressure in said fluid to said hydraulic actuator in said remote locale;

a hydraulic fluid supply reservoir for storing a quantity of said supply of fluid, said fluid in said hydraulic fluid supply reservoir at a pressure that is less than said sufficient pressure; and

an operation control valve in said at least one hydraulic line selectively positionable to put said hydraulic actuator in fluid communication with either of said first hydraulic cylinder and said hydraulic fluid supply reservoir.

34. (Previously Presented) A system for controlling a hydraulic actuator in a remote locale, said hydraulic actuator adapted to operate when provided with a sufficient pressure, said system comprising:

a first hydraulic cylinder;

an isolated supply of fluid provided to said first hydraulic cylinder, said isolated supply of fluid positioned in an environment that is at a pressure other than atmospheric pressure;

an actuator device coupled to said first hydraulic cylinder, said actuator device positioned in said environment, said actuator device adapted to drive said first hydraulic cylinder to create said sufficient pressure in said fluid;

at least one hydraulic line operatively intermediate said first hydraulic cylinder and said hydraulic actuator, said at least one hydraulic line supplying said sufficient pressure in said fluid to said hydraulic actuator in said remote locale;

wherein said first hydraulic cylinder comprises a movable pressure barrier, a first chamber and a second chamber, and wherein said first chamber is adapted to be in fluid communication with said supply of fluid, said second chamber is adapted to be selectably in fluid communication with said hydraulic actuator; and

a bypass control valve selectively providing fluid communication between said first chamber and said second chamber.

35. (Previously Presented) A system for controlling a hydraulic actuator in a remote locale, said hydraulic actuator adapted to operate when provided with a sufficient pressure, said system comprising:

a first hydraulic cylinder;

an isolated supply of fluid provided to said first hydraulic cylinder, said isolated supply of fluid positioned in an environment that is at a pressure other than atmospheric pressure;

an actuator device coupled to said first hydraulic cylinder, said actuator device positioned in said environment, said actuator device adapted to drive said first hydraulic cylinder to create said sufficient pressure in said fluid;

at least one hydraulic line operatively intermediate said first hydraulic cylinder and said hydraulic actuator, said at least one hydraulic line supplying said sufficient pressure in said fluid to said hydraulic actuator in said remote locale;

a resupply line and a resupply coupling, said resupply coupling adapted to interface with an external source of fluid; and

said resupply line being positioned intermediate said resupply coupling and said hydraulic supply reservoir.

36. (Previously Presented) A system for controlling a hydraulic actuator in a remote locale, said hydraulic actuator adapted to operate when provided with a sufficient pressure, said system comprising:

a first hydraulic cylinder;

an isolated supply of seawater provided to said first hydraulic cylinder, said isolated supply of fluid positioned in an environment that is at a pressure other than atmospheric pressure;

an actuator device coupled to said first hydraulic cylinder, said actuator device positioned in said environment, said actuator device adapted to drive said first hydraulic cylinder to create said sufficient pressure in said seawater; and

at least one hydraulic line operatively intermediate said first hydraulic cylinder and said hydraulic actuator, said at least one hydraulic line supplying said sufficient pressure in said seawater to said hydraulic actuator in said remote locale.

37. (Previously Presented) A system for controlling a hydraulic actuator in a subsea well, comprising:

a first hydraulic cylinder;

an isolated subsea source of hydraulic fluid provided to said first hydraulic cylinder;

an actuator device positioned subsea and coupled to said first hydraulic cylinder, said actuator device adapted to drive said first hydraulic cylinder to pressurize said fluid;

at least one hydraulic line for supplying said pressurized fluid to said hydraulic actuator in said subsea well; and

a downhole safety valve, wherein said hydraulic actuator in said subsea well comprises a single-acting hydraulic cylinder having an actuator piston and a return spring, said actuator piston being movable between a first position in which said downhole safety valve is open, and a second position in which said downhole safety valve is

closed, said actuator piston being movable to said first position when said pressurized fluid is supplied to said single-acting hydraulic cylinder, and said actuator piston being movable to said second position by said return spring when said single-acting hydraulic cylinder is vented to thereby allow a pressure of said pressurized fluid to be reduced.

38. (Previously Presented) A system for controlling a hydraulic actuator in a subsea well, comprising:

- a first hydraulic cylinder;
- an isolated subsea source of hydraulic fluid provided to said first hydraulic cylinder;
- an actuator device positioned subsea and coupled to said first hydraulic cylinder, said actuator device adapted to drive said first hydraulic cylinder to pressurize said fluid, wherein said actuator device comprises an electric motor; and
- at least one hydraulic line for supplying said pressurized fluid to said hydraulic actuator in said subsea well.

39. (Previously Presented) A system for controlling a hydraulic actuator in a subsea well, comprising:

- a first hydraulic cylinder;
- an isolated subsea source of hydraulic fluid provided to said first hydraulic cylinder;
- an actuator device positioned subsea and coupled to said first hydraulic cylinder, said actuator device adapted to drive said first hydraulic cylinder to pressurize said fluid;

at least one hydraulic line for supplying said pressurized fluid to said hydraulic actuator in said subsea well; and

a first control valve disposed between said hydraulic cylinder and said hydraulic actuator in said subsea well, said first control valve having at least a first position which allows said pressurized fluid to be supplied to said hydraulic actuator in said subsea well and a second position which vents said pressurized fluid in said hydraulic actuator in said subsea well to thereby reduce a pressure of said pressurized fluid.

40. (Previously Presented) A method of controlling a subsea hydraulic actuator, said hydraulic actuator adapted to operate when provided with a sufficient pressure, said method comprising:

providing an isolated subsea supply of fluid;

providing fluid from said isolated subsea supply of fluid to a first hydraulic cylinder that is actuated to create said sufficient pressure in said fluid, said first hydraulic cylinder being positioned subsea and being operatively connected to said hydraulic actuator by at least one hydraulic line;

communicating said sufficient pressure to said hydraulic actuator via said at least one hydraulic line; and

resupplying fluid to said isolated supply of hydraulic fluid through a resupply line and a resupply coupling, said resupply coupling adapted to interface with an external source of hydraulic fluid, and said resupply line operatively intermediate said resupply coupling and said hydraulic supply reservoir.

41. (Previously Presented) The method of claim 40, further comprising:

filling said first hydraulic cylinder with a portion of said supply of hydraulic fluid by opening a bypass control valve selectively providing fluid communication between a first chamber and a second chamber of said first hydraulic cylinder, said first chamber in fluid communication with said supply of hydraulic fluid, and said second chamber in fluid communication with said hydraulic actuator.

42. (Previously Presented) A system for controlling a hydraulic actuator in a remote locale, said hydraulic actuator adapted to operate when provided with a sufficient pressure, said system comprising:

a first hydraulic cylinder;

an isolated supply of fluid provided to said first hydraulic cylinder, said isolated supply of fluid positioned in an environment that is at a pressure other than atmospheric pressure;

an actuator device coupled to said first hydraulic cylinder, said actuator device positioned in said environment, said actuator device adapted to drive said first hydraulic cylinder to create said sufficient pressure in said fluid;

at least one hydraulic line operatively intermediate said first hydraulic cylinder and said hydraulic actuator, said at least one hydraulic line supplying said sufficient pressure in said fluid to said hydraulic actuator in said remote locale; and

a bypass control valve operatively connected to said first hydraulic cylinder to permit said actuator device to drive said first hydraulic cylinder without substantially increasing a pressure of said fluid.